Hoffmannseggella viridiflora (Orchidaceae, Laeliinae), a New Species from Brazilian Campos Rupestres

Christiano Franco Verola

Programa de Pós-graduação em Ecologia, Universidade Estadual de Campinas, Instituto de Biologia, Departamento de Botânica, Laboratório de Biossistemática e Evolução, Cidade Universitária "Zeferino Vaz," s/n° 13083-970, CP 6109, São Paulo, Brazil. cfverola@yahoo.com.br

João Semir

Universidade Estadual de Campinas, Instituto de Biologia, Departamento de Botânica, Cidade Universitária "Zeferino Vaz," s/n° 13083-970, CP 6109, São Paulo, Brazil

Abstract. The species of the Brazilian genus *Hoffmannseggella* H. G. Jones (Orchidaceae, Laeliinae) are under investigation as part of a biosystematic study. A new species, *H. viridiflora* Verola & Semir, is recognized by differences in morphological characters, such as the spatulate petals and reduced lip, the greenish yellow coloration of the perianth, and the chromosome number, $2n = 44$. Its relationship with closely related taxa, such as *H. bradei* (Pabst) V. P. Castro & Chiron, is discussed.

Resumo. As espécies de *Hoffmannseggella* H. G. Jones (Orchidaceae, Laeliinae), um gênero exclusivamente brasileiro, estão sendo investigadas como parte de um estudo biossistemático. A nova espécie, *H. viridiflora* Verola & Semir, pode ser reconhecida por caracteres diagnósticos como pétalas espatuladas, labelo reduzido, coloração amarelo esverdeado do perianto e o número cromossômico de $2n = 44$. Sua relação com espécies próximas como *H. bradei* (Pabst) V. P. Castro & Chiron é discutida.

Key words: Brazil, cytotaxonomy, *Hoffmannseggella*, Laeliinae, morphology, Orchidaceae, taxonomy.

The Neotropical orchid genus *Hoffmannseggella* H. G. Jones is a member of the subfamily Epidendroideae Kosteletzky, subtribe Laeliinae Bentham. It is one of the most ornamental genera within this subtribe and is distributed only in the Brazilian campos rupestres of Minas Gerais, Rio de Janeiro, Espírito Santo, and Bahia states. Southeastern Brazil, especially Minas Gerais, represents the main center of diversity for plants characteristic of campos rupestres (Harley, 1995; Semir, 1991), including *Hoffmannseggella* (Blumenschein, 1960a, b). Chiron and Castro (2002) recognized 32 species in the genus, but the number has now increased to 42 (Castro & Chiron, 2003; Miranda & Lacerda, 2003; Mota et al., 2003; Campacci, 2005; Chiron & Castro, 2005; Lacerda & Castro, 2005; Miranda, 2005), including *H. viridiflora* Verola & Semir. *Hoffmannseggella* is a taxonomically difficult genus because of the morphological plasticity of species and occurrence of hybridization (Blumenschein, 1960a, b; Van den Berg et al., 2000), and previous generic and specific treatments are in conflict (Schlechter, 1917; Jones, 1968; Pabst & Dungs, 1975; Withner, 1990; Van den Berg & Chase, 2000; Van den Berg et al., 2000; Chiron & Castro, 2002; Van den Berg, 2003).

The range of morphological variation within *Hoffmannseggella*, including hybrids and closely similar species, can lead to difficulties in specific classification and identification. Variation occurs in both vegetative and floral morphology, such as the shape and size of the pseudobulb and the size of leaf, stalk, and pedicel. Floral colors are variable among and within species, including pink, red, orange, yellow, white, and combinations. Perianth characters, such as the shape and ornamentation of the lips and lobes, are associated with other characters (e.g., color and stalk size) and are therefore more diagnostic (Schlechter, 1917; Pabst & Dungs, 1975; Withner, 1990). Other evidence, including cytogenetics, has been useful both in the delimitation of species and in evolution studies in *Hoffmanseggella* (Blumenschein, 1960a, b).

The new species *Hoffmannseggella viridiflora* is here described and illustrated. It can be distinguished from all other species by its greenish yellow flowers, which are the smallest in the genus, together with its apical undulate petals and erect perianth parts.

Material and Methods

Individuals of *Hoffmannseggella viridiflora* and *H. bradei* (Pabst) V. P. Castro & Chiron were collected

from synchronopatric natural populations in Diamantina City, in southeastern Brazil. The plants were maintained in the greenhouse of the Genetic and Evolution Department of the Universidade Estadual de Campinas, São Paulo State. Specimens from the UEC herbarium, as well as those from BHCB, ESA, ESAL, HB, HXBH, MBML, R, RB, SP, and SPF, were examined.

Hoffmannseggella viridiflora Verola & Semir, sp. nov. TYPE: Brazil. Minas Gerais: Diamantina, Conselheiro Mata road, 43°42′W, 18°12′S, 1100 m, 14 Aug. 2003, *C. F. Verola & M. E. Mansanares s.n.* [flowered under cultivation, 12 Dec. 2003] (holotype, UEC 139238). Figure 1.

Haec species *Hoffmannseggellae viridiflorae*, *H. bradei*, *H. itambanae* (Pabst) V. P. Castro & Chiron, *H. verboonenii* (Miranda) V. P. Castro & Chiron et *H. esalqueanae* (Blumenschein ex Pabst) V. P. Castro & Chiron affinis sed floribus viride-flavescentibus, sepalis et labello patentibus brevioribus, petalis spathulatis brevioribus apice undulato, labelli lobo mediano curvato differt.

Perennial rupicolous herb; roots fasciculate, cylindrical, 2.3–3.5 mm; pseudobulbs 41–50 mm, green, 1 or 2 internodes, clavate, basal portion 9–11.3 mm wide to 4.5–5 mm at apex with 2 translucent green, compressed sheaths. Leaf sessile, lanceolate, dark green with purple spots in margins and the abaxial side, 45–48 × 9.5–11.5 mm, smooth, coriaceous, conduplicate, softly reflexed; spathe pale green, asymmetric, oblanceolate, 22–25 × 3.6–4 mm, flattened, softly ventricose on adaxial side. Inflorescence apical, racemiform, stalk 9.1–10 cm, 0.7–1.9 mm diam., erect, rigid, dark green with purple and cream spots, 1 or 2 sterile bracts 3.4–4.2 mm, green, acuminate; raceme 50–55.6 mm, 3- to 5-flowered, erect, rachis green with purple spots, erect; floral bracts translucent, green, triangular, 3.1–4 × 2.5–3.1 mm, persistent, acuminate; pedicel + ovary 23–25 mm, light green, cylindrical. Dorsal sepal brownish yellow adaxially, greenish yellow abaxially, suberect, oblanceolate, 10–10.6 × 3.2–3.7 mm, concave, acuminate; lateral sepals greenish yellow, erect, oblique, oblanceolate, 9–9.5 × 3–3.2 mm, slightly concave, acuminate; petals light greenish yellow, erect, spatulate, 9.5–9.9 × 3.6–4 mm, apically undulate; lip light greenish yellow, erect, trilobate, 6.7–7 × 7.4–7.6 mm, lateral lobes obovate, 6–6.3 × 3–3.2 mm, apex obtuse, tube-shaped and embracing the column, frontal lobe suborbicular, 2.2–2.5 × 2.2–2.5 mm, slightly curved, disc with 4 inconspicuous parallel keels, yellow-ochre; column greenish yellow, subcylindrical, slender, curved, 5.8–6.9 × 2–2.3 mm, subtriangular in transversal section; stigmatic surface deep, subtriangular, 1.4–1.6 mm, separated from the anther by a flexible, viscous and membranous rostellum; anther with 8 cavities, pale yellow, pollinia 8, yellow, dimorphic with 4 smaller. Capsule sulcate, 25–30 × 10–15 mm, delimiting carpels; seeds pale yellow, diminutive.

Etymology. The epithet refers to the greenish yellow color of the perianth of the new species.

Hoffmannseggella viridiflora was collected without flowers from the natural population and cultivated into flower. At first glance, we believed this to be a specimen of *H. bradei* because of the high intraspecific morphological variation and plasticity shown between natural populations of this species. However, comparison of this plant with other closely related species shows that it is a new species, related to the yellow-flowered species of the Diamantina region such as *H. bradei*, *H. esalqueana*, *H. itambana*, and *H. verboonenii*. The new species is closely related to the members of the section *Esalqueanae* (Withner, 1990) that include small plants with short stalks and yellow flowers.

Hoffmannseggella viridiflora flowers in synchronopatry with *H. bradei*, and in this respect it could be a morphological variant of this species. However, their chromosome numbers are different: *H. bradei* has $2n = 40$, whereas *H. viridiflora* has $2n = 44$ (Costa, 2006). *Hoffmannseggella esalqueana* has chromosome number $2n = 40$ (Blumenschein, 1960b). The chromosome number counts for other related species, *H. itambana* and *H. verboonenii*, are unknown. This suggests that *H. viridiflora* may have originated from *H. bradei* by aneuploidy (see Costa, 2006). Aneuploid species are unusual in the genus, where polyploidy prevails in more than 50% of the species (Blumenschein, 1960a, b). Aneuploid complexes were recorded for populations of *H. briegeri* (Blumenschein ex Pabst) V. P. Castro & Chiron (Blumenschein, 1960a) and *H. rupestris* (Lindley) V. P. Castro & Chiron (Costa, 2006). Further corroborating this probable origin of *H. viridiflora* is the low representation of the new species in the original population. Only three individuals were observed for the description, while a few others were unfit to describe, being too old or damaged. They occurred in a mixed population with *H. bradei* and represented about 1% of the total number of individuals of this population. *Hoffmannseggella viridiflora* is endangered because it grows outside a conservation area, in a pasture field near the highway, and is subjected to cattle congestion, occasional fire, and collector action. The endemic status of this species is suggested based on our fieldwork observations and herbarium survey.

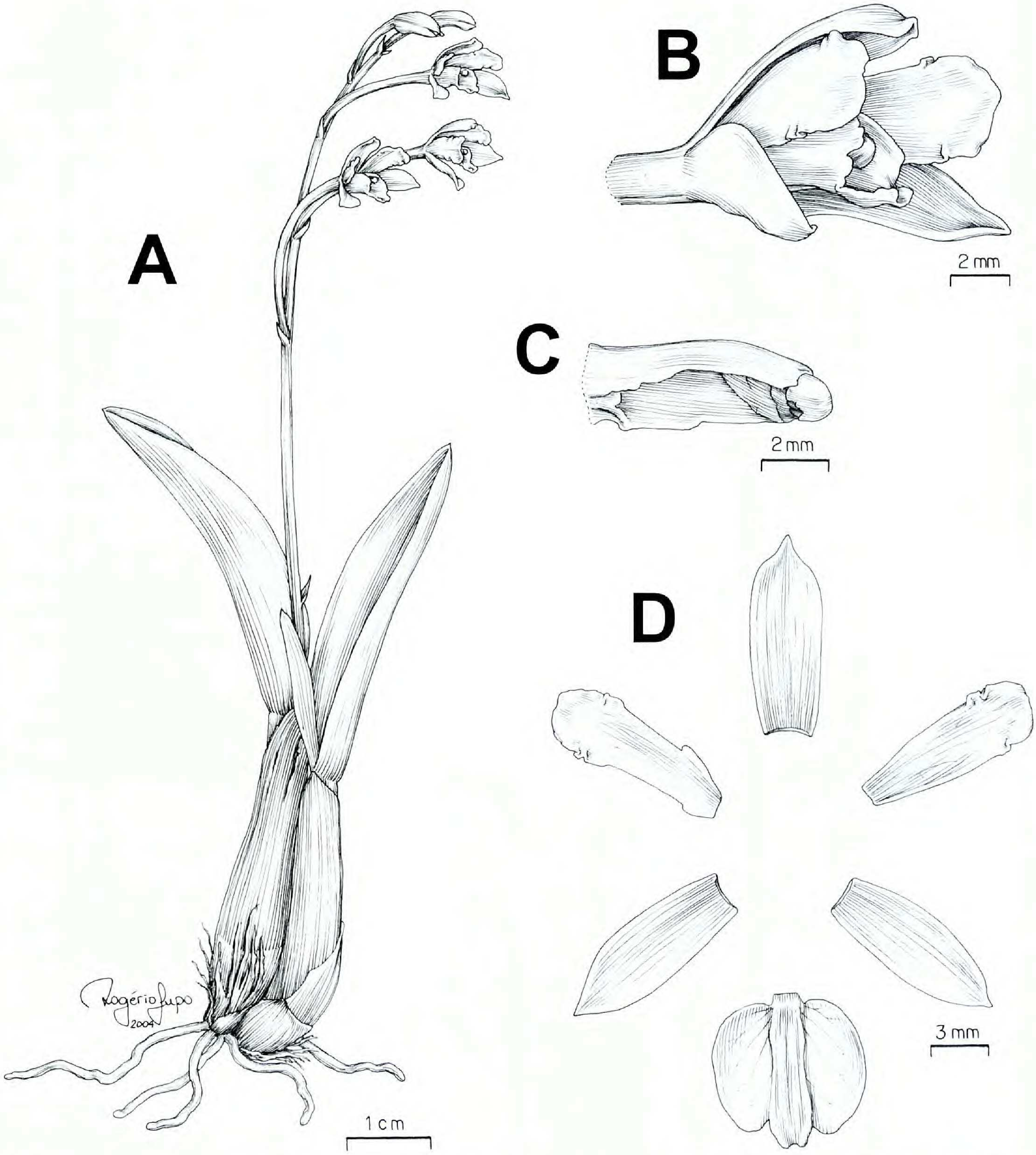


Figure 1. *Hoffmannseggella viridiflora* Verola & Semir. —A. Habit. —B. Flower. —C. Column. —D. Dissected perianth detail. Drawn from the holotype (UEC 139238).

Additionally, an intensive search and georeferenced data bank of natural populations do not indicate another occurrence of this species.

Beyond the cytological evidence, characteristics such as the greenish yellow flowers, the spatulate petals, and the erect portion of the perianth singularly identify this new species. The petals, sepals, and lip are very reduced in relation to related species (Table 1), and the erect midlobe of the lip differs from every other species in the genus due to its recurved shape. The characteristic features of the new species and the differences between *Hoffmannseggella viridiflora* and its related species are summarized in Table 1.

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Table 1. Diagnostic morphological characters of *Hoffmannseggella viridiflora* and closely related taxa. *Characteristics were based on original description, with dashes indicating those not included in descriptions.

Structure	Characters	*H. viridiflora*	*H. bradei* *	*H. esalqueana* *	*H. itambana* *	*H. verboonenii* *
Pseudobulbs	shape	clavate	terete	ovate	terete	elliptical-clavate
	length × width (mm)	41–50 × 9–11.3	40 × 9–10	29 × 8	25–35 × 6–8	30 × 10
Leaf	shape	lanceolate	elliptical	oblong	ovate	linear-lanceolate
	length × width (mm)	45–48 × 9.5–11.5	30 × 15	49 × 14	45 × 25	40 × 10
Floral stalk	length (mm)	91–100	50–60	45	± 40	80
Dorsal sepal	shape	oblanceolate	oblong	oblong-lanceolate	elliptic	lanceolate
	length × width (mm)	10–10.6 × 3.2–3.7	16 × 4	17 × 5	25 × 10	14 × 5
Lateral sepal	shape	oblanceolate	oblong	falcate	ovoid-asymmetric	falcate
	length × width (mm)	9–9.5 × 3–3.2	16 × 5	14 × 5	20 × 12	12 × 5
Petals	shape	spatulate	falcate-tongued	ovate to falcate-tongued	ovate to falcate	lanceolate
	length × width (mm)	9.5–9.9 × 3.6–4	16 × 4	15 × 5	23 × 12	14 × 4.5
	total length × width (mm)	6.7–7 × 7.4–7.6	11 × 9.5	10 × 9	15 × 15	—
Lip	lateral lobe shape / apex shape	obovate to obtuse	ovate to obtuse	ovate to obtuse	semirotund to rotund	subelliptical to falcate
	length × width (mm)	6–6.3 × 3–3.2	8 × 4	—	—	—
Column	length × width (mm)	5.8–6.9 × 2–2.3	5 × 1.75	10 × —	—	6 × 1.2
Pedicel	length (mm)	23–25	18–30	—	40	30

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